MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2018/2019

EME3056 – INDUSTRIAL MANAGEMENT

(ME)

16 OCTOBER 2018
9.00 a.m. - 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 7 pages with 4 Questions only, including the cover.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

Question 1 (25 Marks)

(a) There are two alternative plans for a dried tea leaves packaging factory. The output is measured in boxes of packaged tea leaves. Let Q be the amount of boxes of output in one run. The details are as follows:

Details that are specific to Plan A	:	Labour costs traced to each box, \$ $1.00 + 0.01Q$ Handling costs traced to each box, \$ 0.01 Overhead costs for a run, \$ 200
Details that are specific to Plan B	:	Labour costs traced to each box, \$ 0.50 Handling costs traced to each box, \$ $0.02 + 0.015Q$ Overhead costs for a run, \$ 300

Details that are common to both plans are:
Sales price of each box is \$ 12.00. (Sales are the only source of revenue.)
Purchase costs of ingredients traced to each box, \$ 3.50

i. Mention an example of a reason for why Plan B has lower labour costs but higher overhead and handling costs.

[1 mark]

ii. Find the equation for the total profit for plan A.

[2 marks]

iii. Find the equation for the total profit for plan B.

[2 marks]

iv. Find the profit per unit for plan A, $(dP/dQ)_A$.

[1 mark]

v. Find the profit per unit for plan B, $(dP/dQ)_B$.

[1 mark]

vi. Determine the output of boxes $Q_{A,P}$ for optimal profit from plan A.

[1 mark]

vii. Determine the output of boxes $Q_{B,P}$ for optimal profit from plan B.

[1 mark]

viii. Determine which plan has higher total profit when each plan is at its own optimal number of boxes.

[4 marks]

Continued...

(b) Figure 1 shows the cash flow diagram for a project. The revenues are composed of periodic cash flows R_A. The expenses are composed of periodic cash flows E_A.

The cash flows for revenues and expenses must be such that the equivalent present worth of the expenses PW_E must be equal in value to the equivalent future worth of the revenues FW_R. The values of the cash flows are as follows:

$$R_A = \$780 \quad ; \quad E_A = \$450$$

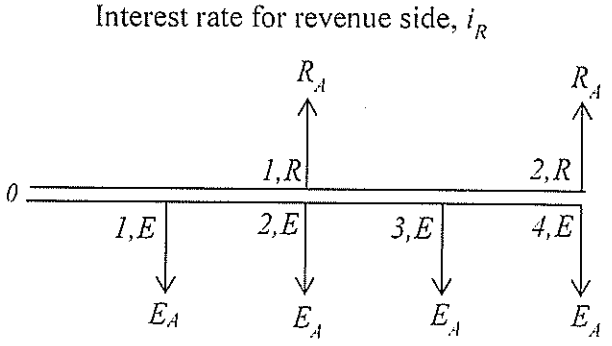

Figure 1

The interest rate i_R is applied on periods $1,R$ and $2,R$ on the revenue side, and the interest rate i_E is applied on periods $1,E$ to $4,E$ on the expense side.

i. Find PW_E.

[2 marks]

ii. Determine the equivalent interest rate i_R which is applied on the revenue cash flows.

[5 marks]

iii. Consider the cash flow diagram. State whether the project actually results in overall loss or profit, and explain your statement. (Hint: consider only present worth or future worth for both sides of the cash flow.)

[2 marks]

iv. Mention a real-life example of a project that requires PW_E to be equal in value to FW_R. Describe the reason for this requirement.

[3 marks]

Continued...

Question 2 (25 marks)

A meat packaging factory requires multiple fields of knowledge, in addition to engineering, for sustainable and safe operation. Therefore, the factory needs the following professionals.

i. Engineer: responsible for the design of the machinery that handles meat and produces the meat products.
ii. Charcuterie expert: this expert knows about the preparation of meat products.
iii. Logistics officer: needed to get meat, other ingredients, spare parts for machines and other supplies to the factory site and manage their storage, consumption and disposal.

The totaled salaries of the professionals have a total of \$10,000 per month. The operational costs for the factory are \$20,000 per month, separate from the salaries of the professionals. The risks of handling these costs are represented as an interest rate of **5% per month, for expenses**.

The revenue of the factory comes from fulfilling purchase orders, which over the years have been observed to follow seasonal trends, as approximated in Figure 2(a). (In the case of this factory, each year has four seasons.) The uncertainties of the orders placed by customers, their reliability at making payments and the factoring of issues from the costs of operation are represented as an interest rate of **10% per season, for revenues**.

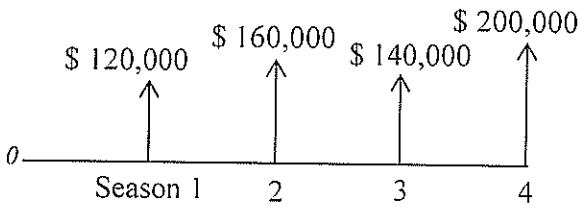

Figure 2(a)

(a) Find the equivalent future worth of the revenues, FW_R, for one year.

[5 marks]

(b) Find the equivalent present worth of the expenses, PW_E, for one year

[2 marks]

(c) Find the external rate of return (ERR) of the factory. (Let $N = 12$ for this calculation.)

[1 mark]

(d) Mention one example of the reasons for having $N = 12$ for calculating the ERR in part (c). (Hint: consider the practicality of this, and notice that $N = 12$ correspond with the number of periods for expenses.)

[2 marks]

Continued...

After having received requests from potential customers, the factory is expanding its operations. The salaries of the professionals remain the same, but **the operational costs are changed to $25,000 per month**. The revenues improve, as shown in Figure 2(b)

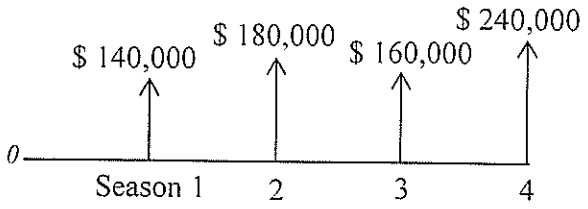

Figure 2(b)

The interest rates for both expenses and revenues remain the same after expansion.

(e) Find the equivalent future worth of the revenues, FW_R, for one year after the expansion.

[4 marks]

(f) Find the equivalent present worth of the expenses, PW_E, for one year after the expansion.

[1 mark]

(g) Find the external rate of return of the factory, after the expansion.

[1 mark]

(h) The external rate of return of the factory, after the expansion, is not expected to be better. However, there are non-financial benefits from the opportunities that can be had from having more customers and expansion of operation.

Describe **one example of a benefit from having more customers and expanded operations.**

[3 marks]

(i) For each of the professionals that have been listed, describe an example of what he/she can do to contribute to the expansion.

[6 marks]

Continued...

Question 3 (25 marks)

a) Maslan has just been appointed as the new manager in 7-Eleven convenient stores. Maslan would like to make sure the stores operate according to Weber's bureaucracy.
   i. Describe the characteristics of bureaucracy.
   (4 marks)
   ii. Discuss whether bureaucracy is a good management approach for Maslan to follow.
   (2 marks)
   iii. Explain the possible limitations of bureaucracy and the implications for managing people as key assets of the stores which consistence with McGregor's Theory Y assumptions.
   (7 marks)

b) A small outdoor clothing company has just received and attractive offer from a business in Vietnam to manufacture its work gloves. The offer would allow for substantial cost savings over the current supplier. The company manager, however, has read reports that some Vietnamese business breaks their own laws and operates with child labor. How would differences in the following corporate responsibilities strategies affect the mangers decision regarding whether to accept the offer;
   i. Obstruction. (3 marks)
   ii. Defense. (3 marks)
   iii. Accommodation. (3 marks)
   iv. Proaction. (3 marks)

Question 4 (25 marks)

a) Briefly explain how planning through benchmarking might be used by the owner of a bookstore to improve the sales and operation in his bookstore.
   (6 marks)

b) Describe in what ways does Anthony Tan (founder of Grab) decision to develop and sell the ride sharing services through apps shows systematic and intuitive thinking.
   (6 marks)

c) Ali was just appointed as a leader of a new product development team, and he was very excited about it. He said to himself on the very first day of his work, "If I can meet the challenges of leadership."
   i. Based on that insight, describe the implications for his personal leadership development of current thinking on transformational leadership and moral leadership.
   (8 marks)
   ii. List **FIVE** important leadership traits and behaviors that he needs to hold.
   (5 marks)

Continued...

Appendix

Future worth of periodic cash flows

$$FW = A\left(\frac{(1+i)^N - 1}{i}\right)$$

Present worth of periodic cash flows

$$PW = A\left(\frac{(1+i)^N - 1}{i(1+i)^N}\right)$$

Future value of a single cash flow

$$FV = C(1+i)^N$$

External rate of return

$$ERR = \left(\frac{FW_R}{PW_E}\right)^{\frac{1}{N}} - 1$$

End of Paper